

IN THE CLAIMS:

Claims 2-4, 9 and 10 were previously canceled. Claim 1 has been amended herein. All of the pending claims 1 through 22 are presented below. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as amended.

1. (Currently amended) A method for forming a contact electrically connected to a metal line, comprising:  
forming an insulation layer situated on a semiconductor substrate;  
forming a contact hole in the insulation layer to expose a contact surface on the semiconductor substrate;  
forming a silicide layer on said the contact surface of said the semiconductor substrate;  
forming a metal nitride layer upon a sidewall of said the contact hole; and  
forming a single layer of metal having a substantially planar top surface upon a top planar surface of the insulation layer, the single layer of metal substantially filling the contact hole and in physical contact with said with the silicide layer and said the metal nitride layer.

Claims 2-4 (Canceled)

5. (Original) The method of claim 1, wherein the insulation layer comprises a material selected from the group consisting of TEOS, doped silicon dioxide, BPSG, PSG, BSG, and silicon nitride.

6. (Original) The method of claim 1, wherein the insulation layer comprises a material selected from the group consisting of oxides, nitrides, carbides, carbon nitrides, and oxynitrides.

7. (Original) The method of claim 1, wherein forming a single layer of metal having a substantially planar top surface upon a top planar surface of the insulation layer comprises: planarizing the insulation layer to form the top planar surface of the insulation layer; depositing the single layer of metal upon the top planar surface of the insulation layer, the single layer of metal having a selected thickness; treating the semiconductor substrate in an environment of a selected pressure range and a selected temperature range so as to cause the single layer of metal to substantially fill the contact hole; planarizing the single layer of metal; and forming a metal line having a selected shape from the single layer of metal.

8. (Original) The method of claim 7, wherein forming a metal line having a selected shape from the single layer of metal comprises patterning and etching the single layer of metal into the metal line having the selected shape.

Claims 9-10 (Canceled)

11. (Original) The method of claim 1, wherein forming a single layer of metal comprises forming the single layer of metal by a deposition process selected from the group consisting of PVD, CVD, electroplating, and electroless plating.

12. (Original) A method for forming a contact electrically connected to a metal line, comprising:

forming an insulation layer situated on a silicon layer upon a semiconductor substrate; forming a contact hole in the insulation layer to expose a contact surface on the silicon layer; forming a refractory metal silicide layer within the contact hole upon the silicon layer; forming a refractory metal nitride layer upon a sidewall of the contact hole in contact with the insulation layer; depositing a single layer of metal upon the insulation layer and in contact with both the refractory metal silicide layer and the refractory metal nitride layer; and treating the semiconductor substrate in an environment of a selected pressure range and a selected temperature range so as to cause the single layer of metal to substantially fill the contact hole.

13. (Original) The method of claim 12, further comprising:

planarizing the single layer of metal; and patterning and etching the single layer of metal into a metal line having a selected shape.

14. (Original) The method of claim 12, wherein depositing a single layer of metal comprises depositing the single layer of metal comprising a material selected from the group consisting of Al, AlCu, and AlCuSi, and wherein forming an insulation layer comprises forming the insulation layer comprising a material selected from the group consisting of TEOS, doped silicon dioxide, BPSG, PSG, BSG, and silicon nitride.

15. (Original) A contact plug and metallization line structure comprising:  
a semiconductor substrate having a contact surface thereon;  
an insulation layer having a contact hole therethrough extending to the contact surface on the  
semiconductor substrate;  
a plug comprised of a first metal and situated in the contact hole, the plug being electrically  
insulated by the insulation layer; and  
a metallization line comprised of a second metal, wherein the plug and the metallization line are  
electrically connected and have a substantially continuous composition gradient of a  
selected alloying element between the first metal and the second metal;  
wherein the contact surface has a first refractory metal silicide layer thereon in contact with a first  
end of the plug.

16. (Original) The contact plug and metallization line structure of claim 15, wherein  
each of the first and second metals is selected from the group consisting of Al, AlCu, and  
AlSiCu, and wherein one of the first and second metals has a higher concentration of Cu than the  
other of the first and second metals.

17. (Original) The contact plug and metallization line structure of claim 15, wherein  
the first and second metals have substantially the same composition.

18. (Original) The contact plug and metallization line structure of claim 15, wherein  
the plug has a second end opposite the first end and in contact with a second refractory metal  
silicide layer, the second refractory metal silicide layer being in contact with the metallization  
line.

19. (Original) A contact plug and metallization line structure comprising:  
a semiconductor substrate having a contact surface thereon;  
an insulation layer comprising a doped oxide of silicon and having a contact hole therethrough  
extending to the contact surface on the semiconductor substrate;  
a plug comprised of a first metal and situated in the contact hole, the first metal being selected  
from the group consisting of aluminum and alloys thereof, the plug being electrically  
insulated by the insulation layer; and  
a metallization line comprised of a second metal, the second metal being selected from the group  
consisting of aluminum and alloys thereof, wherein the plug and the metallization line are  
electrically connected and have a substantially continuous composition gradient of a  
selected alloying element between the first metal and the second metal;  
wherein the contact surface has a first refractory metal silicide layer thereon in contact with a first  
end of the plug.

20. (Original) The contact plug and metallization line structure of claim 19, wherein  
the first and second metals comprise a material selected from the group consisting of AlSi, AlTi,  
AlAg, AlAu, AlMn, AlNa, AlW, AlCuZn, and AlNi.

21. (Original) The contact plug and metallization line structure of claim 19, wherein  
the insulation layer comprises a material selected from the group consisting of oxides, nitrides,  
carbides, carbon nitrides, and oxynitrides.

22. (Original) The method according to claim 1, wherein the single layer of metal  
comprises a material selected from the group consisting of AlAg, AlAu, AlMn, AlNa, AlW,  
AlCuZn, and AlNi.